it insoluble. Sweet spirit of niter is recommended to increase the action of the kidneys. Wiechowski recovered 33 per cent injected atropin from the urine. It is well, therefore, to catheterize to prevent reabsorption from the urine. Pilocarpin is regarded by Small as the most efficient antagonist, as its action on the heart is directly opposite, by restoring the inhibitory action of the vagus after it has been paralyzed by atropin. It also promotes action of glands inhibited by the alkaloid. As morphin contracts the pupils it has been suggested as a physiological antidote, but many claim that, as a physiological antidote, this is as far as it goes. Yet clinical experience has demonstrated its great value in combating the delirium of atropin poisoning. Holz, in a recent report, states that the antagonism between morphin and atropin is established, that morphin is not a chemical antidote but it stimulates the nerves paralyzed by atropin.

Dr. Sewall, discussing the paper read by Dr. Gibbons on "Atropin Poisoning:" This paper is very interesting and I am especially concerned with what the doctor said in regard to the length of time the delirium continued. I have seen a number of cases in the service of Dr. Barkan, but in nearly all these cases the delirium has only lasted for a few hours. Sometimes it has been very violent. In children the delirium has been brought on by as little as three drops of 1 per cent atropin solution dropped into the eyes, although we make it a rule always to apply the finger over the lachrymal sac. In a case which we had recently, it was necessary to use a great amount of atropin and for a long time. In spite of all the medication the pupil had a tendency to contract. We used large doses of atropin instilled into the eyes. The patient took the drug very well for a time, then suddenly the nervous system showed signs of derangement and later he had those symptoms described by Dr. Gibbons. We discontinued the drug until he became rational and apparently normal, and then as it was still necessary to use the drug, we continued, but found that the slightest amount of the drug would throw the man out of his balance and he became delirious again. He trembled and would become very much excited. Whether this was due to some psychical disturbance or not, I do not know. After his nervous system was once overcome, we had to be very careful of the amount we used.

Dr. Gray: I have seen two cases of atropin poisoning in children and one in an adult. A favorite prescription in the Children's Clinic is a grain of atropin in one ounce of water, of which as high as 12 drops t. i. d. have been given to children of 10 or 12 years with no disagreeable effects, though continued over a long period of time. This prescription was given to a child of 20 months with instructions to give four drops at bedtime. Instead, the mother gave a teaspoonful, equal of one-eighth grain of atropin. Symptoms of poisoning appeared in about one hour, but were treated as acute indigestion by a neighbor, who gave emetic. No relief of symptoms resulted from this, and after eight hours I was called to the child, which I found in delirium with convulsions, the tongue greatly swollen and dry, the child unable to swallow, the pupils widely but not extremely dilated, the pulse very rapid and the skin of the face and body a brilliant red. The temperature was not taken. I gave the child a hypodermic of one-eighth grain of morphin and the convulsions subsided in 15 minutes and the delirium practically disappeared. I then gave one-sixteenth grain of pylocarpin by hypodermic, which resulted in the appearance of slight moisture on the tongue.

After 15 minutes another one-sixteenth was given, and with this saliva appeared quite freely in the mouth and slight perspiration in the skin. The child was given a drink of water, after which it slept for eight hours and awoke in apparently normal condition.

Another child of two and a half years had had, sometime previously, a bad cough. Pills were left containing atropin 1-250 with instructions to give one, and if it controlled the cough to discontinue, but if it did not to give another every four hours. Some months afterward I was called and found the child in convulsions. It had long intervals of convulsions and was perfectly delirious, picking with the hands, face quite flushed. The mother thought she had fever. The body was somewhat flushed. Pulse rate very rapid, 160; respiration quite rapid, no nausea, skin dry, able to swallow. I gave this child 1-24 of morphin by mouth and left instructions to have 1-24 given every hour until the child slept. Next day the child was perfectly normal. I told the mother that I felt that the child had taken something of this kind and asked about the pills. It finally came out, that during the day the mother had been sweeping and cleaning the room and she had laid the pills in a little box on the bed. The child was playing about and the mother remembered afterward that she had heard the child say, "I will be all well now." She was not able to find the pills and the only conclusion to come to was that the child had found the pills and had taken them.

I am satisfied that there is a greater susceptibility to atropin poisoning in adults than in children. An adult can get this alarming condition with a belladonna plaster. The symptoms with the drug always seem to be about the same. The convulsions are not so common in the adult.

CYCLODIALYSIS FOR CHRONIC GLAUCOMA.*

By E. C. SEWALL, M.D., San Francisco.

There is no disease of the eyes which has received more careful study than chronic primary glaucoma, nor is there a disease which has presented more difficulty in the solving of its pathology, or in devising a cure. Hippocrates has mentioned it, and it has come down through the ages as a recognized entity until the discovery of the ophthalmoscope and more modern methods of pathology and physiology have to a certain extent made

*Read before the Eye, Ear, Nose and Throat Society.

its processes *seem,* at least, fairly clear. It is interesting that the hardness of the globe was recognized and sclerotomy performed to relieve it, before the ophthalmoscope permitted a view of the interior of the eye, and also that Von Graefe, while considering the disease a chronic iridochoroiditis, performed the epoch-making operation of iridectomy.

These two operative procedures had their supporters, but the former has been quite abandoned in favor of the iridectomy. The iridectomy done first, on, we might say, empirical grounds, in the light of modern methods has led indirectly to the operation, cyclodialysis.

In chronic glaucoma, the iris lies forward so that the angle of the anterior chamber is closed. This prevents the excretion of fluid, by mechanical interference. The iridectomy relieves this condition. Fuchs, however, observed that it did more than merely free the chamber corner. He claimed that there was a rupture of the ligamentum pectinatum, which allowed a communication between the anterior chamber and the supra-choroidal lymph space.

From these results of careful thought, the operation of cyclodialysis was evolved by Professor Dr. Heine in Breslau. He very cleverly conceived the idea of both freeing the chamber corner and establishing communication between the supra-choroidal space and anterior chamber without the removal of the iris. Briefly, he enters the supra-choroidal space near the cornea, through the sclera, and then, separating the parts, enters the anterior chamber. The technic of the operation, I will give in his own words:—

"Above or below, temporal or nasal from the corneo-scleral limbus, at a distance from this of five to ten mm, cut through the conjunctiva and episcleral tissue until the sclera is laid bare. Taking hold near the limbus with the forceps, the eyeball is steadied, and an incision made parallel to a tangent to the limbus passing through this point. The incision extends to the ciliary muscle, and is made with a straight or bent iridectomy lance.

"One takes the lance in the hand as a pen, and the perforation of the sclera can be felt. Make the opening in the sclera about two mm long. Now introduce into this wound a small spatula such as is used for replacing the corners of the iris after iridectomy, taking care to work with spatula always pressed outward against the sclera. When the instrument is pushed forward as far as the ligamentum pectinatum, some resistance is felt. This is overcome slowly and then the spatula is seen to appear in the anterior chamber. Excursions are now made to each side, so as to separate the iris widely from its basal attachment. The spatula is now slowly withdrawn and more or less of the aqueous can be allowed to pass out as desired. The conjunctival wound is sutured by a catgut suture and eye bandaged. If one has allowed no aqueous to escape, there will be no alteration in the tension immediately following the operation, but becomes apparent in three to four days. The operation is almost painless under cocain and adrenalin and general narcosis is necessary only in children."

Prof. Heine brings up several questions that naturally arise. Does the communication produced heal immediately and leave simply an irido-dialysis which acts merely by freeing the chamber corner? Is not the supra-choroidal space entirely obliterated in a case of chronic glaucoma? These questions a greater amount of experience and material alone will answer.

He reports favorably on the operation after operating on fifty cases, and he gives account of many cases where cyclodialysis has relieved conditions where iridectomy failed. Most of the iridectomies were performed by Prof. Uthoff in Heidelberg, which insures their careful performance.

It is perhaps too soon to form an adequate idea of the results to be obtained from this operation, but while visiting Axenfeld's clinic, I saw the operation performed several times, and also a number of times in Fuch's clinic. This shows the interest aroused in the best clinics in Europe, and we can soon hope for enough statistical material to place a value on the method. It certainly presents some points of striking advantage; principal among these, is the fact that the pupil is not interfered with, and consequently disturbance of vision caused. There is also no danger of injury to the lens.

The case I show this evening is one of long-standing glaucoma in both eyes. A native of Germany, 53 years of age, collector by trade, presented himself May 27, 1906, at the clinic of Cooper Medical College, under the service of Dr. Barkan, complaining of increasing loss of vision. Noticed trouble in left eye twelve years previous, right, four years ago. Vision in right eye, fingers in 5 feet with correction —2.5, 20-40; in the left eye, hand movements, no improvement possible. The disc was cupped and the tension increased; the field in the right eye was much contracted, impossible to take the left field. Cornea clear, sensitive, anterior chamber shallowed. Was treated with pilocarpin and returned to the clinic from time to time. Vision was constantly decreasing in the right eye.

Three months ago I operated upon both eyes by the method of Prof. Heine. Vision in the right eye then was, fingers in 4 feet; in the left, hand movements. I employed a general anesthetic in order to give me greater control over the eyes, not knowing what the difficulties might be. The incision through the sclera was difficult to make, because of lack of experience and fear of injury to structures underlying. After a little patience, however, the sclera was perforated and the spatula introduced into the wound and pushed without trouble into the anterior chamber. I then moved it upward and downward in an endeavor to detach the iris widely. The operation on the second eye was much easier than the first, and would see no occasion again of employing general anesthesia. Patient was kept in bed and quiet for some days. There was absolutely no inflammatory reaction. Pilocarpin was instilled regularly and has been used since the operation.

It is difficult to judge what the results of these operations have been. To all appearances, the eyes have never been operated upon. The vision remains about the same as before the operation. No detachment of the iris can be seen, though this was freed quite widely. The tension, however, is certainly better, though the patient is using pilocarpin regu-

larly. However, we may say there was not the immediate decrease in vision that sometimes follows a large iridectomy-coloboma, and the results hoped for may be achieved, *i. e.*, the retention of what vision he has. In case of further failure of vision, nothing prevents a reperformance of the operation.

PROPRIETARY PREPARATIONS APPROVED BY COUNCIL ON PHARMACY AND CHEMISTRY.

Continued from Feb., 1907.

ARGONIN.

A soluble casein compound containing 4.28 per cent. of silver.

Actions and Uses.—Its actions and uses are similar to those of silver nitrate, but it is claimed to have greater power of permeating living colloid membranes than other silver albumoses. It is applied as an injection in 0.1 to 0.2 per cent. solution; in ophthalmic practice a 10 to 20 per cent. solution in glycerin may be used. Dosage.—It is generally used in 0.5 per cent. solution, but even 20 per cent. solutions have been injected without producing irritant symptoms. Manufactured by Farbewerke vorm. Meister, Lucius & Bruening, Hoechst a. M. (Victor Koechl & Co., New York).

ARGYROL.

A compound of a derived proteid and silver oxide, containing from 20 to 25 per cent. of silver.

Actions and Uses.—Solutions of argyrol (20 to 50 per cent.) are said to be non-irritating to mucous membranes. Taken internally it is said to be non-toxic. It is claimed to be an antiseptic. It is recommended in urethritis and cystitis, in conjunctrovitis and in affections of the nose, throat and ear. Dosage.—It is employed in from 10 to 25 per cent. and even stronger solutions. Manufactured by Barnes & Hille, Philadelphia.

ARISTOCHIN.

Aristochin.—$CO(C_{20}H_{23}N_2O_2)_2=C_{41}H_{46}N_4O_5$, the neutral carbonic ester of quinine.

Actions and Uses.—The same as those of quinine, but, since it is only slowly acted on by acids, it is said not to produce disturbance of the stomach and to be notably free from tendency to production of cinchonism. Dosage.—The same as that of quinine, in powder, mixed with milk sugar, dry on the tongue or suspended in liquids. Manufactured by Farbenfabriken, vorm. Friedr. Bayer & Co., Elberfeld, Germany (Continental Color & Chemical Co., New York).

ARISTOL.

A name applied to Thymolis Iodidum, U. S. P. Manufactured by Farbenfabriken vorm. Friedr. Bayer & Co., Elberfeld, Germany (Continental Color & Chemical Co., New York).

ASPIRIN.

Aspirin $C_6H_4O(CH_3CO).COOH$, 1:2$=C_9H_8O_4$, the acetyl derivative of salicylic acid.

Actions and Uses.—It acts like salicylic acid, over which it possesses the advantage of producing less of the undesired local and systemic side effects, on account of the slow liberation of the salicylic acid. It passes the stomach unchanged, the decomposition beginning in the intestine. Dosage.—0.3 to 1 Gm. (5 to 15 grains) in capsules or wafers, or dissolved in sweetened water or dry on the tongue, followed by a swallow of water. The powder should be dispensed in waxed paper. Manufactured by Farbenfabriken, vorm. Friedr. Bayer & Co., Elberfeld, Germany (Continental Color & Chemical Co., New York).

BENZOSOL.

Benzosol, $C_6H_4(OCH_3)(C_6H_5COO)=C_{14}H_{12}O_3$, a crystalline compound of guaiacol in which the hydrogen of the hydroxyl is replaced by benzoyl.

Actions and Uses.—Benzosol is decomposed slowly in the intestinal tract into guaiacol and benzoic acid which exert their proper actions. The liberated constituents are absorbed and excreted in the urine. It is not irritating. Its uses are analogous to those of creosote and benzoic acid. It is recommended in incipient pulmonary tuberculosis, as an intestinal antiseptic in fermentation, diarrhea, typhoid fever, diabetes mellitus and as a urinary disinfectant in cystitis, etc. Dosage.—0.2 to 0.6 Gm. (3 to 10 grains), in powder, capsule, pill, or suspended in liquids or as an emulsion. Manufactured by Farbwerke, vorm. Meister, Lucius & Bruening, Hoechst a. M. (Victor Koech & Co., New York).

BETA-EUCAINE HYDROCHLORIDE.

Beta-eucaine hydrochloride, $C_5H_7N(CH_3)_3(C_6H_5COO).HCl$, the hydrochloride of 2,6,6-trimethyl-4-benzoyl-hydroxypiperidine. Actions and Uses.—Beta-eucaine hydrochloride is a local anesthetic like cocaine, but weaker and devoid of the stimulating properties of the latter. It does not dilate the pupil, nor does it contract the blood vessels as does cocaine. It has the advantage of stability even on prolonged boiling. It may be used in all cases in which cocaine is indicated as a local anesthetic, especially in ophthalmology. Dosage.—It may be applied in a 2 to 3 per cent. solution to the eye, 5 to 10 per cent. for nose and throat, and 5 to 10 per cent. for ointment for hemorrhoids. Manufactured by Chemische Fabrik auf Actien, vorm. E. Schering, Berlin (Schering and Glatz, New York).

BETA-NAPHTHOL BENZOATE.

Beta-napthol benzoate, $C_6H_5COO.C_{10}H_7=C_{17}H_{12}O_2$, the benzoic ester of B-naphthol.

Actions and Uses.—Beta-naphthol benzoate is split up into its constituents on reaching the intestinal tract and acts as an antiseptic. It is said to be diuretic. It is used internally as an intestinal antiseptic in diarrhea and typhoid fever. Externally it has been recommended as a parasiticide in the form of 3 to 10 per cent. ointment, and has been used in psoriasis, eczema, scabies, etc. Dosage.—0.2 to 0.5 Gm. (3 to 8 grains); maximum dose, single, 1 Gm. (15 grains), daily 4 Gm. (60 grains). Manufactured by Fabrik von Heyden, Radebeul near Dresden (Merck & Co., New York).

BETOL.

Betol, $C_6H_4.OH.COO(C_{10}H_7)=C_{17}H_{12}O_3$, the salicylic ester of B-naphthol.

Actions and Uses.—Betol is not affected in the stomach, but is split up in its original components when it reaches the intestinal tract by the pancreatic juice and intestinal secretions. It is believed to act as an intestinal antiseptic and, being excreted in the urine, to act in a similar way in the bladder. It has the anti-rheumatic properties of salicylic acid. It is recommended for intestinal fermentations, catarrh of the bladder, particularly in gonorrheal cystitis, for rheumatism, etc. Dosage.—0.3 to 0.5 Gm. (4 to 8 grains) in cachets, milk or emulsion. Manufactured by the Heyden Chemical Works, New York.

BISMAL.

Bismal, $4(C_{15}H_{12}O_{10}).3Bi(OH)_3=Bi_3C_{60}H_{57}O_{49}$, a compound of bismuth hydroxide and methylendigallic acid.

Actions and Uses.—Bismal is an astringent and is recommended for the treatment of chronic diarrhea. Dosage.—0.12 to 0.3 Gm. (2 to 5 grains) in cachets or powder. Manufactured by E. Merck, Darmstadt (Merck & Co., New York).